## CLIMATE AND ALFALFA SEED.

Weather records have just been put to a splendid use by the Utah State Farm Bureau, which is handling the alfalfa seed pool for the State. The following is a portion of a report reprinted from the *Salt Lake City Telegram* of December 27, 1920, to show the bearing of climatic data on the sale of the seed:

The Utah State Farm Bureau in offering the Utah alfalfa seed crop for sale through Eastern State farm bureaus was informed by the Michigan State Farm Bureau of Lansing that "Utah seed, originating as it does mostly from more southerly climates, and not having the severe winters that we have, in its present habitat, has not proven hardy enough for our conditions." In reply, comparative weather data was furnished for Deseret, Emery, and Fort Duchesne, Utah, as representing the districts from which seed was being offered. These data were compared directly with similar values for Lansing, covering the average monthly, mean maximum, mean minimum, monthly extreme highest, and lowest temperatures, and the average dates of latest killing frost in spring and the earliest in autumn, which show that the Utah seed is acclimated to somewhat more severe temperatures than those prevailing at Lansing, the Utah temperatures being higher in summer and lower in winter, with greater daily ranges and a shorter summer season between frosts.

The commercial agent for the State farm bureau writes: "Information of this kind is going to be very valuable to us. The alfalfa seed deal which we are now handling for the grower will amount to several hundred thousand dollars, and we certainly appreciate the willing spirit which you manifest in cooperating with us."—*J. Cecil Alter.*

## INFLUENCE OF CLIMATE ON THE YIELD AND QUALITY OF SUGAR BEET IN CANADA.

By E. G. McDougall, M. A., Dominion Meteorological Service, Toronto.

[Abstracted from *Monthly Bull. of the Dominion Bureau of Statistics*, vol. 13, No. 146, Oct., 1920, Ottawa.]

With the view of determining the suitability of soil and climatic conditions in various parts of the Dominion for the growth of sugar beets, Dr. Frank T. Shutt, dominion chemist and assistant director of experimental farms, inaugurated in 1902 an investigation of the subject, which included experimental plots at various points in the country. The reports of the division of chemistry, issued annually, contain the details and data collected in this work, which is now in its eighteenth year. The data as published include the percentage of sugar in the juice, the percentage of solids in the juice, and the coefficient of purity. The yield per acre is estimated, and owing to the small size of the plots, these data are of somewhat doubtful accuracy.

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The author has correlated the experimental data with the weather factors during the growing season. The correlations between the percentage of sugar and the weather factors are decidedly small, but the coefficient of purity (the percentage of sugar in the dissolved solids) is more significantly related to weather conditions, having its highest correlation (a positive one) with the mean minimum temperature for the season. The yield shows a positive relation with both maximum and minimum temperatures, and most significantly with the mean temperature for the season. It has a high positive correlation with the relative humidity, and an unexpected low one with the rainfall.

The studies as published prompt the following conclusions: The yield is closely related to the mean temperature, and, in a less degree, to the mean relative humidity of the growing season. Conditions are favorable when the mean temperature exceeds 60° F. and the relative humidity exceeds 80 per cent. They are unfavorable when the temperature falls below 55° and the relative humidity below 70 per cent. Within ordinary limits the yield is not very greatly affected by the rainfall, provided the crop is thoroughly cultivated. In semiarid regions irrigation increases the yield without impairing the quality. The quality of the beets depends chiefly on the night temperatures; the sugar content and purity decline when the mean temperature for the season falls below 45°.—*J. B. K.*

## CRITICAL PERIODS OF RICE.

By B. Marcarell.

[Abstracted from *International Review of the Science and Practice of Agriculture*, March, 1919; International Institute of Agriculture, Rome.]

In rice growing the two most important climatic factors are heat and light. The critical periods of rice are those during which it has an absolute need of a certain minimum quantity of heat and light. If these minimums are not available at these periods the yield will be small even though the temperature be high and the days sunny throughout the rest of the vegetative period. In northern Italy, the critical periods are during tillering (more especially when the rice turns yellow before tillering) and during the formation of the panicle. If at these two stages the heat is not sufficient to keep the atmosphere of the rice field at a minimum temperature of 13° to 14° C. (55° to 57° F.) for the first stage and 15° to 16° C. (59° to 61° F.) for the second, according to the variety of rice cultivated, the yield in paddy may be partly compromised.—*J. W. S.*